



Potential on-shore Carbon Dioxide Storage in Europe – two Examples of R & D Activities in Austria and Germany

R. Meyer (1), **H. M. Schulz** (1), F. May (1), S. Alles (2), B. M. Krooss (2)

(1) Bundesanstalt für Geowissenschaften und Rohstoffe BGR, Germany, (2) Institute of Geology and Geochemistry of Petroleum and Coal, RWTH-Aachen University, Germany

Various case studies and test sites for CO₂ storage in porous rocks have been proposed or are under investigation in Europe, most of them in offshore settings. On-shore storage sites in contrast, offer better conditions for CO₂ injection and monitoring. In order to avoid unacceptable risks to human health near on-shore locations, a careful site selection and site investigation is required. Here we present two examples of potential on-shore storage sites that are presently being studied in European joint research projects.

In the framework of the EU co-founded CO2STORE project, the on land storage site “Schweinrich” in the Northeast German Basin is currently under investigation (<http://www.co2store.org>). In an initial survey, several potential structures have been identified in Northern Germany and evaluated with respect to their geological storage properties. The selected site is a passive anticlinal structure consisting of Mesozoic formations (saline aquifers) with an expected storage volume capable to retain the CO₂ produced in the operating time of a modern, lignite fired power plant.

Along with the reservoir-geological characterisation, several other investigations are under way:

- 3D geological modelling combined with flow simulations to predict the long term fate of the CO₂ within the reservoir
- geochemical modelling to predict the effects of CO₂ storage on reservoir and seal properties

- development of a site specific risk assessment, with the assessment of several local risks as well as the likelihood of hazards

Atzbach-Schwanenstadt is a natural gas field situated in the upper Austrian Molasse Basin, between Salzburg and Linz. This onshore sandstone gas field at approximately 1600 m below the Earth's surface is nearly depleted. Rohoel AG considers its transformation into a CO₂ storage site and a location to test the suitability of CO₂ injection for Enhanced Gas Recovery. This site has been selected as a case study site in the EU-funded R&D project CASTOR (European CASTOR project on the capture and geological storage of CO₂, <http://www.co2castor.com>). Among four other sites it is the only onshore site within this project. Objectives of this joint research project are:

- the generation of an improved geological model
- determination of geochemical and geomechanical reservoir and caprock properties
- reservoir simulation of long term effects related to CO₂ injection
- simulation of long term geomechanical reactions of the reservoir overburden
- feasibility study of high resolution seismic monitoring of CO₂ in the reservoir
- CO₂ diffusion and break-through experiments on cap rocks
- elaboration of a gas geochemical baseline monitoring plan

First results from the latter two tasks will be presented. The ultimate goal of these tasks is to provide information for an integrated risk management. Regarding the site Schweinrich we will present findings from the geological site characterisation including the 3D geological and geochemical modelling.